Validation Rules for the Spatial Data Standard (SDSFIE)   **2.200.000 – May 21, 2002**

Entity Sets - - - -

1. Each *Entity Set Name* **must** be unique and **must not** contain spaces.
2. Each *Entity Set Abbreviation* **must** be unique.
3. Each Entity Set **must** contain a *Definition*.
4. Each Entity Set *Common Name Prefix* **must** be unique.

Entity Classes - - - -

1. Each Entity Class **must** reference a valid *Entity Set Name*.
2. The *Entity Class Name* **must** begin with the complete Entity Set Entity Class Prefix.
3. Each Entity Class *Key Column* **must** be unique, be > 0, and may **never** be changed. These *Key Columns* may **never** be reused. If a class is deleted, that *Key Columns* number is retired.
4. Each *Entity Class Name* **must** be unique **and must not** contain spaces.
5. Each *Entity Class Abbreviation* **must** be unique within an Entity Set and, once assigned, may **never** be changed.
6. Each *Map Prefix* shall consist of the referenced Entity Set Abbreviation and the *Entity Class Abbreviation*
7. An *Entity Class Name* may be changed, but the *Map Prefix* and *Key Columns* **must not** be changed.
8. If an Entity Class contains FMS tables, it is coded as being a FMS class.
9. FMS Classes **must not** contain any Entity Types.
10. Each IDEF Model Name shall begin with the *Map Prefix* and end with a three digit representation of the SDS Release; e.g. 180.
11. Entity Classes coded as FMS classes **must** have a *Entity Class Name* ending in "_fm".
12. Each Entity Class *Table Prefix* **must** begin with the complete Entity Set *Common Name Prefix*.
13. Entity Classes coded as SDS classes **must** reference a *Feature Dataset Name*, and that *Feature Dataset Name* must be 30 characters or less.*

Entity Types - - - -

1. Each Entity Type **must** reference a valid *Entity Class Name*.
2. Each Entity Type **must** reference a valid *Entity Set Name* corresponding to the Entity Set for assigned Entity Class.
3. Each Entity Type Name **must** contain a reference to the *Object Type* of the Entity Type. This is normally through the use of AREA, POINT, SITE, LINE, or ARROW etc.
4. The Entity Type *Key Column* **must** be unique, be > 0, and may **never** be changed. These *Key Columns* may never be reused. If an Entity Types is deleted, that *Key Column* number is retired.
5. Each *Entity Type Name* **must** be unique.
6. Each Entity Type **must** contain a reference to the corresponding *Object Type*; e.g. G/GT Polygon, String/Chain, Point, Point/Polygon, or Arrow.
7. Each Entity Type **must** contain a reference to the coverages associated with the *Object Type*.
8. Each Entity Type Coverage Name **must** be unique.
9. Each Entity Type **must** have coverage names based on type in accordance with [G/GT Polygon] - *Polygon Coverage*, [String/Chain] - *Line Coverage*, [Point] - *Point Coverage*, [Point/Polygon] - *Polygon Coverage* and *Point Coverage*.
10. If an Entity Type references an Attribute Table in *Table Name*, it **must** be a valid, graphic Attribute table.
11. An Entity Type **must** reference the same *Table Name* as any related Entity.
12. If an Entity Type references a discriminating *Domain Table*, it **must** contain a *Discriminator Name*, which is an attribute coded as a Discriminator in the referenced Attribute *Table Name*.
13. Each Entity Type **must** reference a *Feature Class Name* and that *Feature Class Name* **must** be unique, and that *Feature Class Name* must be 30 characters or less, with no spaces (use "_" in lieu of spaces).*
14. Each Entity Type **must** reference a *Feature Dataset Name* and that *Feature Dataset Name* **must** correspond to the *Entity Class Name* to which the Entity Type belongs.
15. If an Entity Type references a discriminating *Domain Table*, it **must** contain a *Default SubType*, which is a Value from the List Domain Table.

Entities - - - -

1. Each Entity **must** reference a valid *Entity Type Name*.
2. Each Entity **must** reference the *Entity Class Name* referenced by it's Entity Type.
3. Each *Entity Name* **must** begin with the Abbreviations for the Entity Set and Entity Class; e.g. the Entity Class *Map Prefix*.
4. Each Entity Name **must** end in '_b', '_c', '_l', '_p', '_a', or '_t', based on the corresponding *Element Type*.
5. Each Entity *Key Column* **must** be unique**,** be > 0, and may **never** be changed. These *Key Columns* may never be reused. If an Entity is deleted, that *Key Column* number is retired.
6. Each Entity Name **must** be unique.
7. Each Entity *Alphabetic Code* **must** be unique and be 10 Characters in length**.**
8. Each Entity *Alphabetic Code* **must** begin with the corresponding code for the Entity Set and Entity Class; e.g. the Entity Class *Map Prefix* and end with the letter corresponding to the *Element Type*.
9. Each non-Text Entity (P, L, B, C) should have a *Level or Layer* which is unique within its Entity Class.
10. The Text Entities (A and T) for a given feature should share a common *Level or Layer*.
11. Each Entity *Discriminator Value* **must** be either "N/A" or a value from the corresponding discriminator Domain Table.
12. If the Entity has a *Discriminator Value* other than "N/A", the referenced Entity Type must contain a reference to a Domain containing that *VALUE*.
13. If the referenced Entity Type does not contain a Domain reference, the *Discriminator Value* **must** be "N/A".
14. If an Entity of *Element Type* "L", "C", "P", or "A", it **must** reference the same *Table Name* as the corresponding Entity Type.
15. Each Entity **must** contain a *Position* code based on [1] for boundary '_b' entities, [2] for linear '_l' entities, [3] for point '_p' entities, [4] for centroid '_c' entities, [5] for annotation '_a' entities, and [6] for text '_t' entities.
16. Each Entity of *Element Type* A **must** contain a four character Annotation Prefix ending in *. These must be unique within a Coverage; e.g. within a set of Entities referenced by a single Entity Type.
17. Each Entity **must** reference a valid SDS *Color*.
18. Each Entity of *Element Type* 'P' **must** be *Line Width* 4.
19. Each Entity of *Element Type* 'B' or 'L' **must** reference a valid SDS *Line Type*.

Features - - - -

1. Each Feature **must** reference a valid *Entity Type Name*.
2. The *Discriminator* **must** reference either a valid Entity *Discriminator Value* or contain 'N/A'.
3. If a *Feature Alias* refers to more than one Entity Type/Discriminator combination, it **must** contain a *Modifier*.
4. If an Entity Type has a discriminator, the Features associated with that Entity Type **must** reference all of the individual discriminators.
5. Each *Modifier* **must** be unique within the referring *Feature Alias*
6. The Feature Master *Occurrences* **must** indicate the number of times a particular *Feature Alias* appears in the Feature Table.

Tables - - - -

1. Each Table **must** reference a valid *Entity Class Name*
2. Each *Table Name* **must** begin with the applicable Entity Set and Entity Class Code; e.g. the *Map Prefix*.
3. Each *Table Name* **must** contain either 7 or 8 characters and **must** be unique.
4. Each Table **must** have a *Common Name* and they **must** be unique
5. Each Table **must** contain at least 3 Attributes. These are the Primary Key, a USER FLAG, and a META_ID.
6. A Table Name may be changed. However, the original *Table Name* may **never** be reused.
7. Each Table Key Column **must** be unique, be > 0, and may **never** be changed. These *Key Columns* may never be reused. If a Table is deleted, that *Key Column* is retired.
8. If a Table is a Graphic table; i.e. *Table Type* = 16, it **must** contain DATALINK as the first attribute.
9. If a Table is referenced in an Entity/Entity Type, is **must** be a Graphic table; i.e *Table Type* = 16.
10. If a Table is not referenced in an Entity/Entity Type, is **must** be a Non-Graphic table; i.e. TABLE TYPE = 64.
11. For a Non-Graphic table, the Primary Key **must** be the first (Position #2) attribute in the table. For a Graphic table, the Primary Key **must** be the second (Position #2) attribute in the table.
12. If a *Table Type* is Non-Graphic, it **must** be in a FMS Entity Class.

13. If a *Table Type* is Graphic, it **must** be in a SDS Entity Class.
14. Each Table **must** reference an Object *Class Name* and that *Object Class Name* **must** be unique, and that *Feature Class Name* must be 30 characters or less, all upper case, with no spaces (use "_" in lieu of spaces). If at all possible, the *Object Class Name* should correspond with the Table *Common Name*.*

Attributes - - - -

1. Each Attribute **must** reference a valid *Table Name*.
2. Each Attribute Name **must** be unique within any given Table and have a maximum of 10 characters.
3. Each Attribute **must** contain a unique *Position* within a Table, which, once assigned, may **never** be reused and cannot be changed.
4. Each Attribute **must** have a Data Type which must be "C"(Character), "M" (Unstructured Memo Text), "S" (Short Integer), "D" (Double Precision), "I" (Integer/Long Integer), or "R" (Real/Single Precision).
5. Each Primary Key **must** end in "_id" and have a minimum *Character Length* 20 if it is of *Data Type* "C". If it is an numeric, it **must** be *Data Type* "I".
6. Each Attribute that is a Foreign Key **must** end with "_id". If at all possible, the first occurrence of a foreign key within the table should precisely match the Primary Key name of the table to which the Foreign Key joins. "_id" Attributes **must** be *Data Type* "C" and *Character Length* matching the Primary Key to which it joins. with the exception of "map_id".
7. Each Attribute with a *Data Type* of "M" (Unstructured Memo Text) **must** have a NULL *Character Length***.**
8. Each Graphic Table **must** contain a "map_id" attribute which **must** be *Data Type* "I".
9. Each Attribute ending in "_d" **must** be *Data Type* "C" and *Character Length* 16 or one of the numeric *Data Types* "S", "D", "I", or "R".
10. Each Attribute ending in "_d" **must** reference a valid *Domain Name*, *Domain Table*, and *Domain Number*. The *Domain Number* and *Domain Name* shall be consistent with the name and number which appears in **DOMAINS** for that *Domain Table*.
11. Each Attribute ending in "_d" which is coded as being a numeric **must** reference a valid **RANGE DOMAIN**.
12. Each Attribute ending in "_d" which is coded as *Data Type* "C" **must** reference a valid **LIST DOMAIN**.
13. Each Attribute ending in "_d" which is coded as *Data Type* "C" **must** either be a *Character Length* 16 or be coded as a *Source* [DISA][NIMA]
14. If an Attribute is a unit of measure attribute, is **must** end with "_u_d" and reference the *Domain Table* d_uom.
15. An Attribute **may not** be added to a any table with a position less than the highest position in that table.
16. If an Attribute is of *Data Type* "C", it **must** contain a positive *Character Length*.
17. If an Attribute is a date Attribute, it **must** be a *Data Type* "I" and **must** have a *Character Length* of 1
18. If an Attribute is a date Attribute, the definition **must** end with the statement "Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915)."
19. If an Attribute is a time Attribute, it **must** be a *Data Type* "I" and **must** have a *Character Length* of 2
20. If an Attribute it a time Attribute, the definition **must** end with the statement "Format for time of day is HHMMSS. Use the standard 24 hour clock."
21. If as Attribute is defined as FMS, it **must** be in a FMS table and **must not** be in a SDS table.
22. Each Attribute **must** contain a *Common Name* and this *Common Name* **must** end in a designated DISA Identifying word
23. Each Primary Key *Common Name* **must** be "PRIMARY KEY IDENTIFIER
24. Each Foreign Key *Common Name* **must** be "FOREIGN KEY JOIN to " and the Table Name. In cases where this would result in duplications within a given table, a descriptive word(s) may be added in parenthesis at the end of The *COMMON NAME* such as (OWNER), (INPUT), (OUTLET), etc
25. Each Attribute *Common Name* **must be unique** within a given table.

Domains - - - -

1. Each *Domain Name* **must be UNIQUE** and may not contain special characters or spaces. The "_" character is permitted in lieu of a space.
2. Each Domain *Table Name* **must be UNIQUE** and begin with "d_".
3. Each Domain *Key Column* **must be UNIQUE** and be >0. These *Key Columns* may never be reused. If a Table is deleted, that *Key Column* is retired.
4. Each *Domain Type* **must** be either "R" for a Range Domain or "L" for List Domains.
5. Each *Domain Name* **must** be referenced by at least one Attribute.

List Domains - - - -

1. Each List Domain **must** reference a valid *Domain Name.*
2. Each List Domain *Full Value* **must be UNIQUE** within a given domain.
3. Each List Domain *Value* **must be UNIQUE** within a given domain.
4. Each List Domain *Value* **must not** contain spaces or special characters and be 16 characters or less.
5. Each domain which is not a discriminator domain **must** contain the values of "UNKNOWN", "TBD", and "OTHER".
6. Each domain value **must** match a *Discriminator Value* in the Entities table.
7. The *Key Column* and *Domain Name* referenced in List Domains **must** match the corresponding *Key Column* and *Domain Name* in Domains.

Range Domains - - - -

1. Each Range Domain **must** reference a valid *Domain Name*.
2. Each Range Domain *Max Value* **must** be greater than the *Min Value.*
3. Each Range Domain *key column* **must be UNIQUE** and be > 0. These *Key Columns* may never be reused. If a Range Domain is deleted, that *Key Column* is retired.
4. The *Key Column* and *Domain Name* referenced in Range Domains **must** match the corresponding *Key Column* and *Domain Name* in Domains.

Joins Relations - - - -

1. Each Join Relations *Key Column* **must be UNIQUE** and be > 0. These *key columns* may never be reused. If a Join Relations is deleted, that *Key Column* is retired.
2. Each Join Relations *First Attribute Name* **must** match the Primary Key of the *First Table Name*.
3. Each Join Relations *Second Attribute Name* **must** match a Foreign Key of the *Second Table Name*.
4. Each *Relationship* **must** equal the *First Table Name . First Attribute Name = Second Table Name . Second Attribute Name*.
5. Each *First Attribute Name* **must** equal the *Second Attribute Name*, except in cases where their are multiple Foreign Key links to the same table.
6. Each Join Relation entry shall contain a *Relationship Name*, which shall be unique, and be 30 characters or less.*

*** Changed or added with the SDSFIE/FMSFIE Release 2.20.**